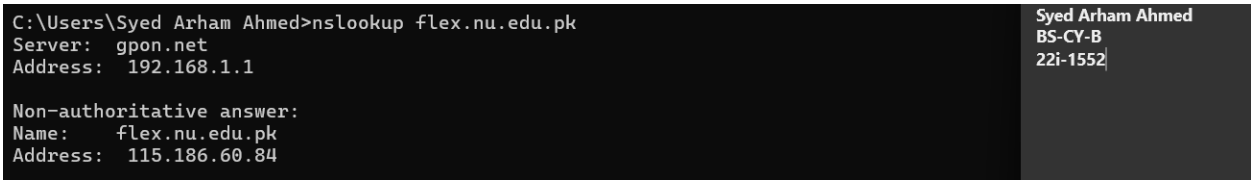
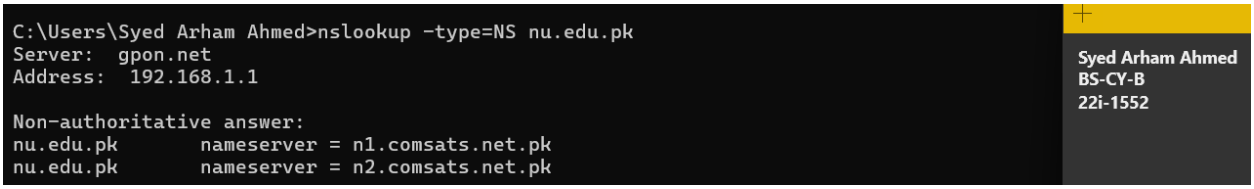
Task#1:

Q.1.

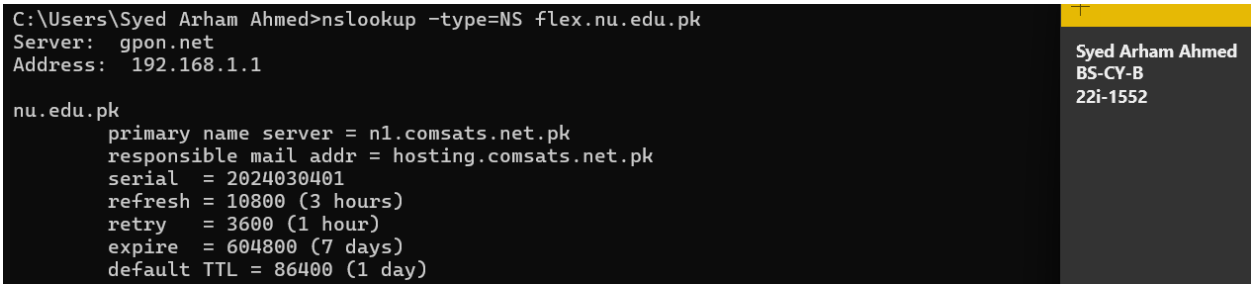
Q.2.



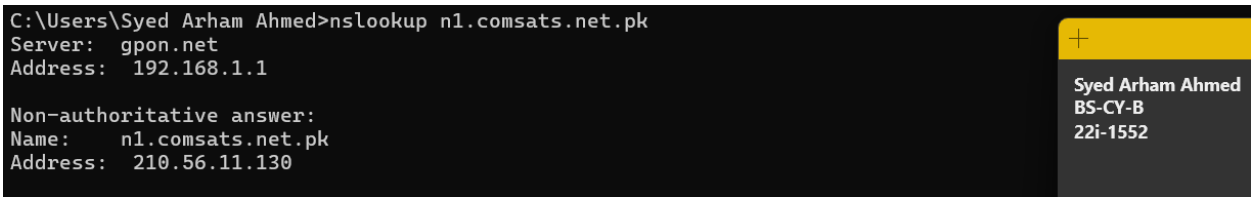
Q.3.



Q.4.



Q.5.



Q.6.

```
C:\Users\Syed Arham Ahmed>nslookup -query=mx nu.edu.pk
Server:  gpon.net
Address:  192.168.1.1

Non-authoritative answer:
nu.edu.pk       MX preference = 10, mail exchanger = aspmx5.googlemail.com
nu.edu.pk       MX preference = 5, mail exchanger = alt2.aspmx.l.google.com
nu.edu.pk       MX preference = 5, mail exchanger = alt1.aspmx.l.google.com
nu.edu.pk       MX preference = 10, mail exchanger = aspmx2.googlemail.com
nu.edu.pk       MX preference = 0, mail exchanger = aspmx.l.google.com
nu.edu.pk       MX preference = 10, mail exchanger = aspmx4.googlemail.com
nu.edu.pk       MX preference = 10, mail exchanger = aspmx3.googlemail.com
```

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Q.7.

```
C:\Users\Syed Arham Ahmed>nslookup -type=NS giki.edu.pk
Server:  gpon.net
Address:  192.168.1.1

Non-authoritative answer:
giki.edu.pk     nameserver = ns2.giki.edu.pk
giki.edu.pk     nameserver = ns.giki.edu.pk
giki.edu.pk     nameserver = localns2.giki.edu.pk
giki.edu.pk     nameserver = localns1.giki.edu.pk
giki.edu.pk     nameserver = ns1.giki.edu.pk
```

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```
C:\Users\Syed Arham Ahmed>nslookup -type=soa giki.edu.pk
Server:  gpon.net
Address:  192.168.1.1

Non-authoritative answer:
giki.edu.pk
        primary name server = ns.giki.edu.pk
        responsible mail addr = shakir.giki.edu.pk
        serial  = 958
        refresh = 900 (15 mins)
        retry   = 600 (10 mins)
        expire  = 86400 (1 day)
        default TTL = 3600 (1 hour)
```

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```
C:\Users\Syed Arham Ahmed>nslookup ns2.giki.edu.pk
Server:  gpon.net
Address:  192.168.1.1

Non-authoritative answer:
Name:    ns2.giki.edu.pk
Address:  119.159.235.50
```

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Q.8.

```
C:\Users\Syed Arham Ahmed>nslookup nu.edu.pk 1.1.1.1
Server:  one.one.one.one
Address:  1.1.1.1

Non-authoritative answer:
Name:    nu.edu.pk
Address:  203.124.44.78
```

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```
C:\Users\Syed Arham Ahmed>nslookup nu.edu.pk 8.8.8.8
Server:  dns.google
Address:  8.8.8.8

Non-authoritative answer:
Name:    nu.edu.pk
Address:  203.124.44.78
```

Task#2:

Q.1.

```
┌──(arham㉿kali)-[~]
└─$ dig nu.edu.pk

; <<>> DiG 9.18.16-1-Debian <<>> nu.edu.pk
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 13120
;; flags: qr rd ra ad; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 0

;; QUESTION SECTION:
;nu.edu.pk.                     IN      A

;; ANSWER SECTION:
nu.edu.pk.              5991    IN      A       203.124.44.78

;; Query time: 4 msec
;; SERVER: 192.168.1.1#53(192.168.1.1) (UDP)
;; WHEN: Sat Mar 16 15:01:25 PKT 2024
;; MSG SIZE  rcvd: 43
```

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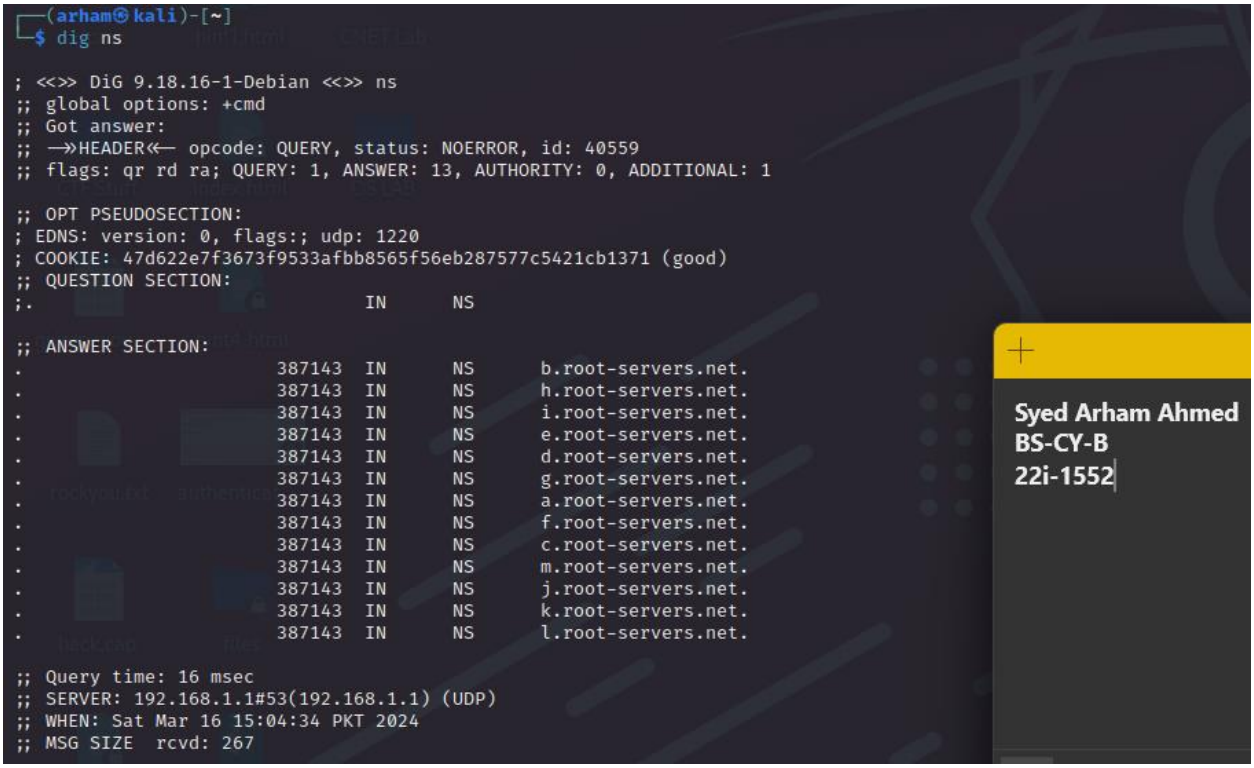
The record type is A, which stands for Address Record.

Q.2.



We can see 13 root servers after command dig ns.

Q.3.


(arham㉿kali)-[~]
$ dig +short NS nu.edu.pk
n2.comsats.net.pk.
n1.comsats.net.pk.
(arham㉿kali)-[~]
$ dig n2.comsats.net.pk nu.edu.pk
; <<>> DiG 9.18.16-1-Debian <<>> n2.comsats.net.pk nu.edu.pk
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 63845
;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1
;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 1220
; COOKIE: 65b4ccb66bdeea0b1ba33b4865f57d71267007bc2a822416 (good)
;; QUESTION SECTION:
;n2.comsats.net.pk. IN A
;; ANSWER SECTION:
n2.comsats.net.pk. 9541 IN A 210.56.11.131
;; Query time: 48 msec
;; SERVER: 192.168.1.1#53(192.168.1.1) (UDP)
;; WHEN: Sat Mar 16 16:07:31 PKT 2024
;; MSG SIZE rcvd: 90
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 39971
;; flags: qr rd ra ad; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 0
;; QUESTION SECTION:
;nu.edu.pk. IN A
;; ANSWER SECTION:
nu.edu.pk. 2027 IN A 203.124.44.78
;; Query time: 4 msec
;; SERVER: 192.168.1.1#53(192.168.1.1) (UDP)
;; WHEN: Sat Mar 16 16:07:31 PKT 2024
;; MSG SIZE rcvd: 43
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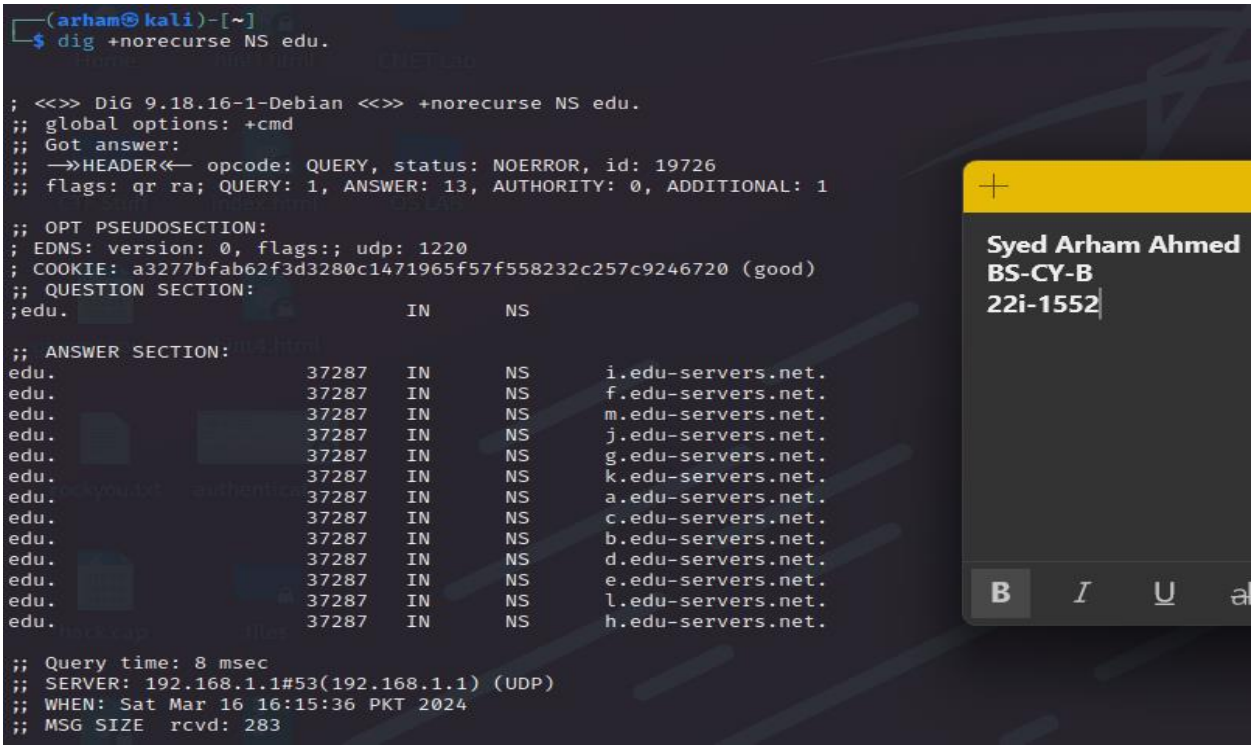
Q.4.


(arham㉿kali)-[~]
$ dig +norecurse NS edu.
; <<>> DiG 9.18.16-1-Debian <<>> +norecurse NS edu.
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 19726
;; flags: qr ra; QUERY: 1, ANSWER: 13, AUTHORITY: 0, ADDITIONAL: 1
;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 1220
; COOKIE: a3277bfab62f3d3280c1471965f57f558232c257c9246720 (good)
;; QUESTION SECTION:
;edu. IN NS
;; ANSWER SECTION:
edu. 37287 IN NS i.edu-servers.net.
edu. 37287 IN NS f.edu-servers.net.
edu. 37287 IN NS m.edu-servers.net.
edu. 37287 IN NS j.edu-servers.net.
edu. 37287 IN NS g.edu-servers.net.
edu. 37287 IN NS k.edu-servers.net.
edu. 37287 IN NS a.edu-servers.net.
edu. 37287 IN NS c.edu-servers.net.
edu. 37287 IN NS b.edu-servers.net.
edu. 37287 IN NS d.edu-servers.net.
edu. 37287 IN NS e.edu-servers.net.
edu. 37287 IN NS l.edu-servers.net.
edu. 37287 IN NS h.edu-servers.net.
;; Query time: 8 msec
;; SERVER: 192.168.1.1#53(192.168.1.1) (UDP)
;; WHEN: Sat Mar 16 16:15:36 PKT 2024
;; MSG SIZE rcvd: 283
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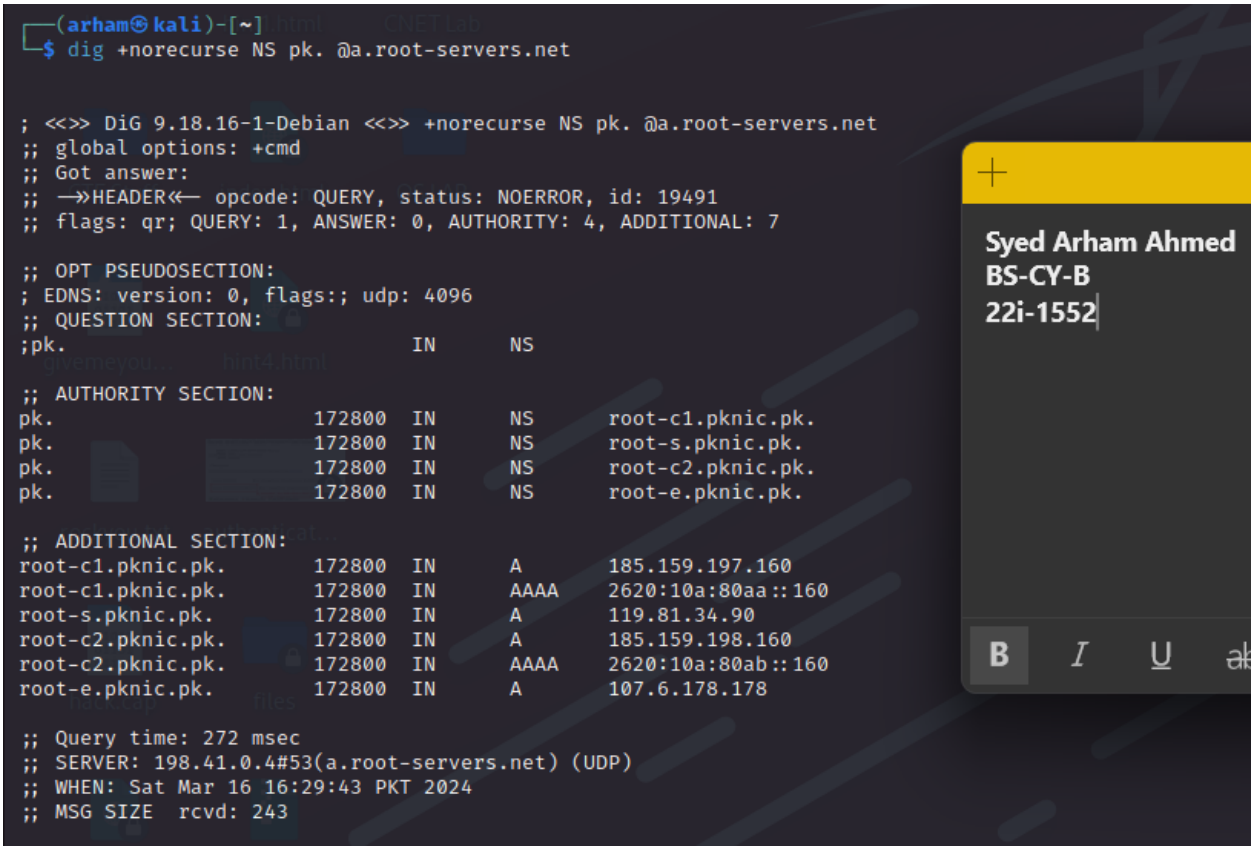
Q.5.


(arham㉿kali)-[~]
$ dig +norecurse NS pk. @a.root-servers.net
; <<>> DiG 9.18.16-1-Debian <<>> +norecurse NS pk. @a.root-servers.net
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 19491
;; flags: qr; QUERY: 1, ANSWER: 0, AUTHORITY: 4, ADDITIONAL: 7
;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 4096
;; QUESTION SECTION:
;pk. IN NS
;; AUTHORITY SECTION:
pk. 172800 IN NS root-c1.pknic.pk.
pk. 172800 IN NS root-s.pknic.pk.
pk. 172800 IN NS root-c2.pknic.pk.
pk. 172800 IN NS root-e.pknic.pk.
;; ADDITIONAL SECTION:
root-c1.pknic.pk. 172800 IN A 185.159.197.160
root-c1.pknic.pk. 172800 IN AAAA 2620:10a:80aa::160
root-s.pknic.pk. 172800 IN A 119.81.34.90
root-c2.pknic.pk. 172800 IN A 185.159.198.160
root-c2.pknic.pk. 172800 IN AAAA 2620:10a:80ab::160
root-e.pknic.pk. 172800 IN A 107.6.178.178
;; Query time: 272 msec
;; SERVER: 198.41.0.4#53(a.root-servers.net) (UDP)
;; WHEN: Sat Mar 16 16:29:43 PKT 2024
;; MSG SIZE rcvd: 243
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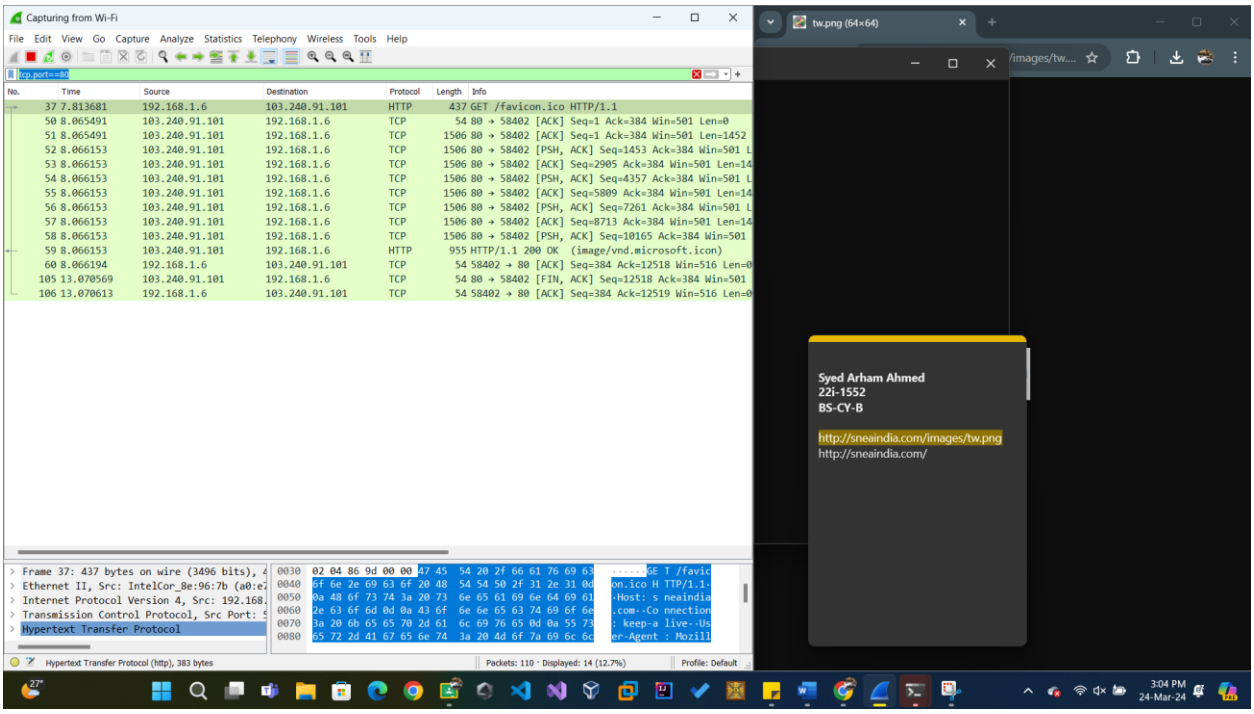
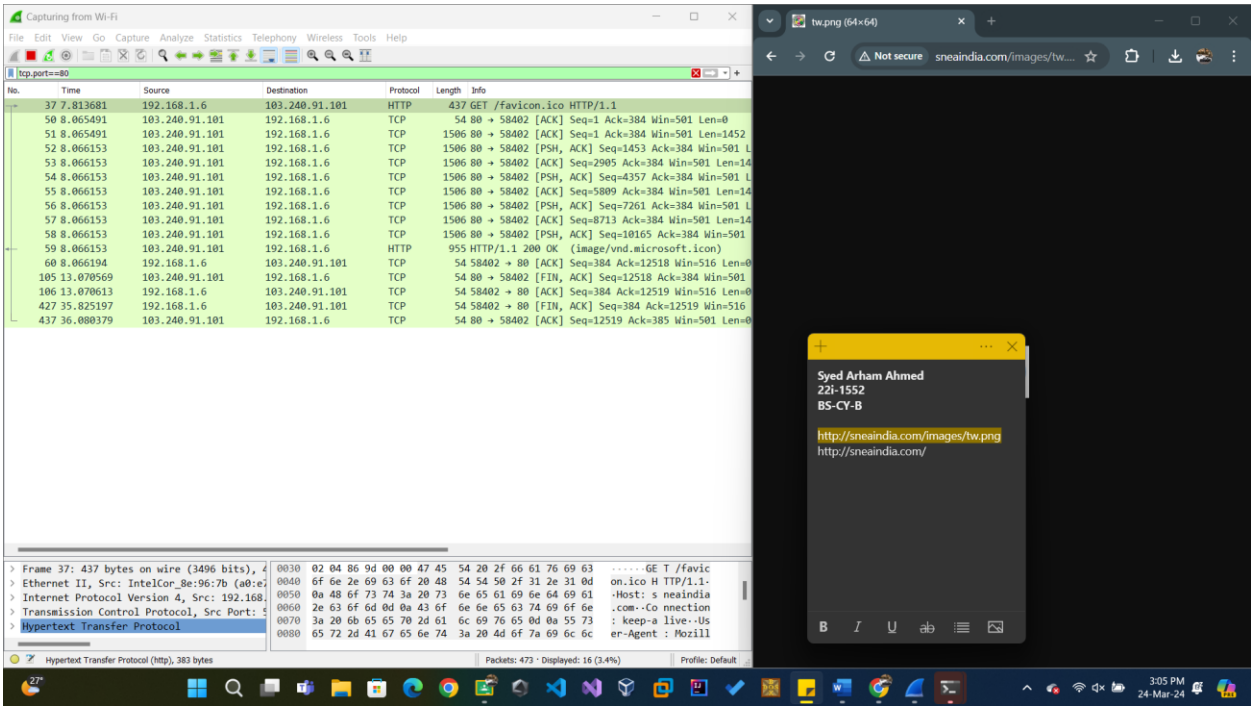
Task#3:

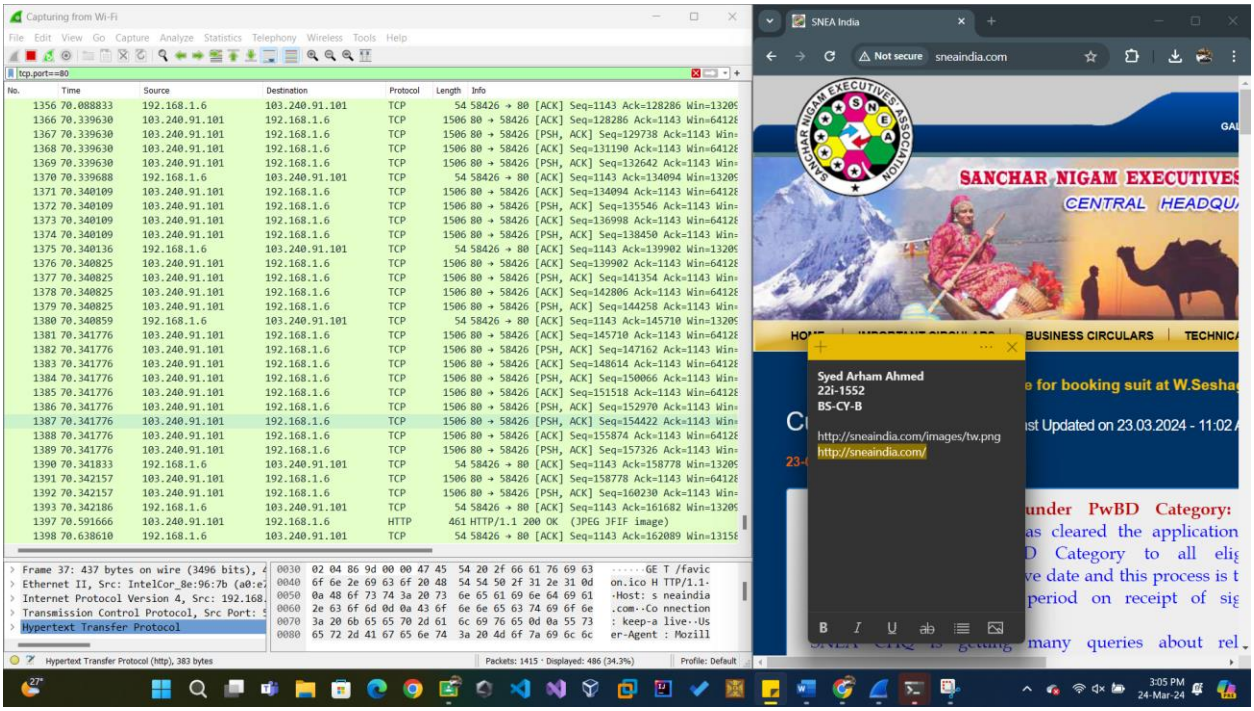
Q.1.





So, the difference that I noticed now is that when I re-pasted the URL is that it did not generate more than 2 more packets, this means that cache was used to fetch the URL contents, and it did

not do TCP handshake again as well saving us time when re opening the URL. I can also see the HTML code of the still webpage if I follow and open HTTP stream of the packets.

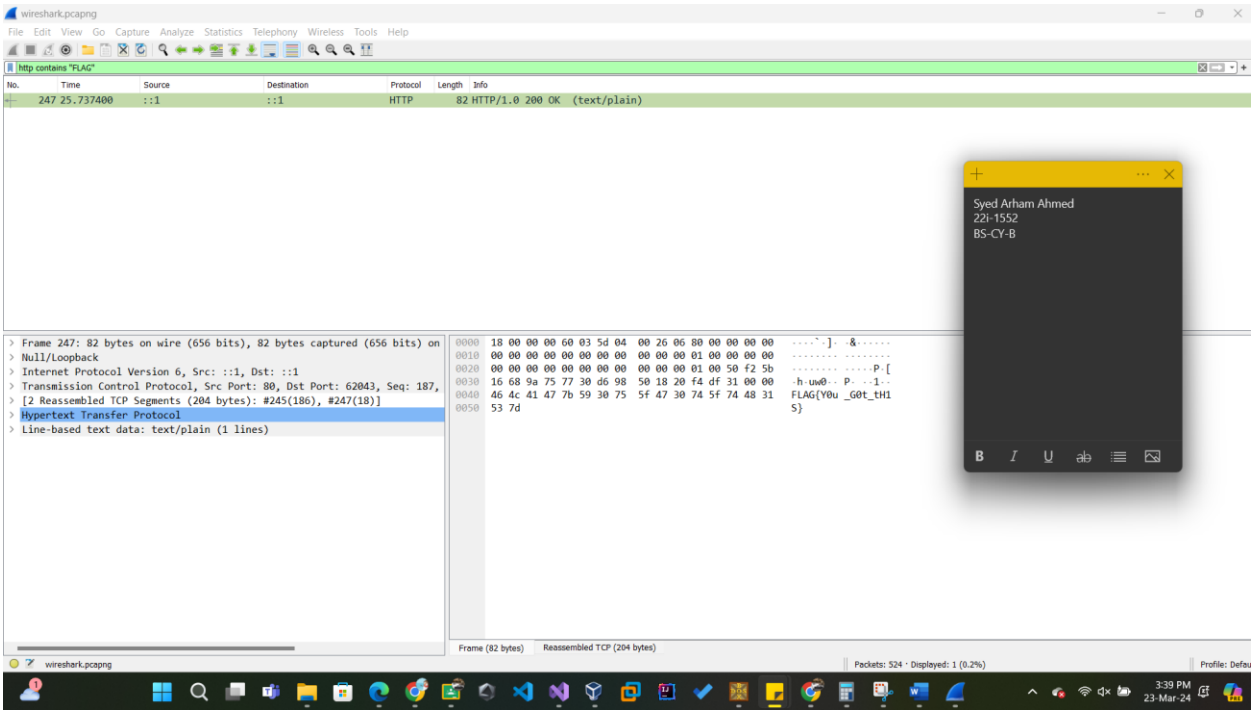


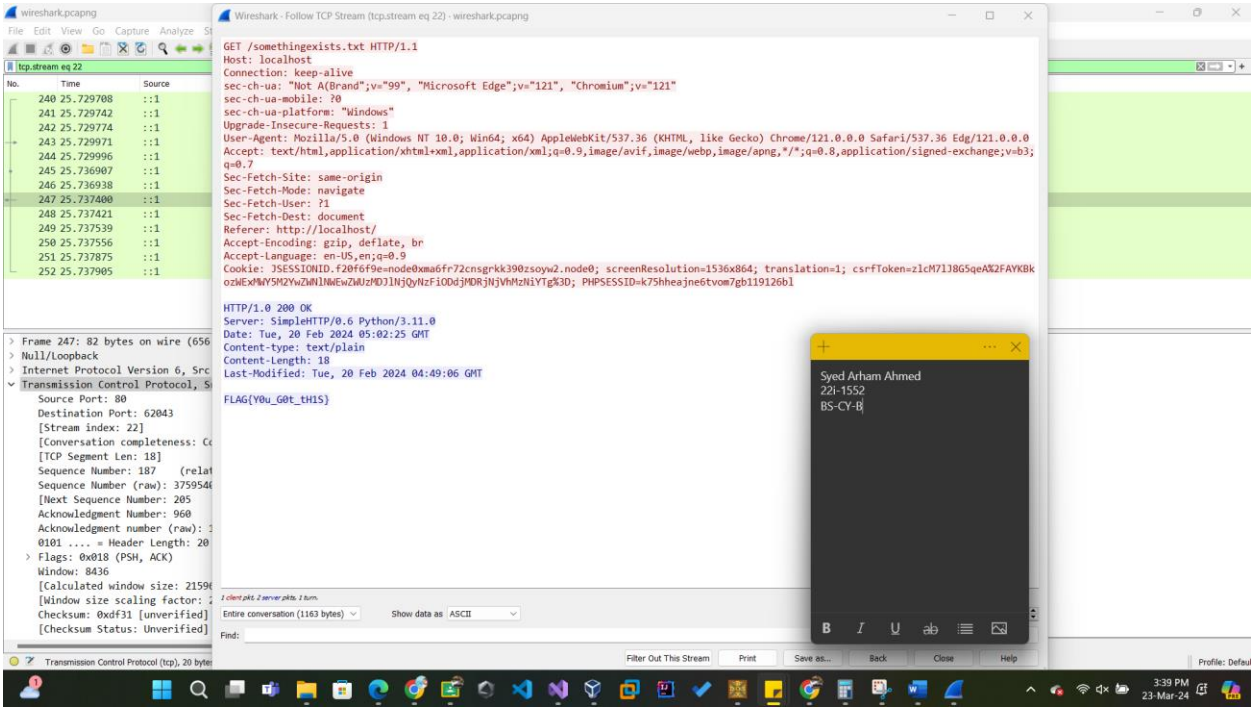
Well, the static image URL did not generate many packets but the whole website generated thousands of packets as a lot more data needed to be loaded other than just still images with no embeds.

Q.2.

http contains "FLAG" {This command searches for the word FLAG in the TCP packets}

I ran the command listed above and it gave me the packet ie:247 which contains the flag.





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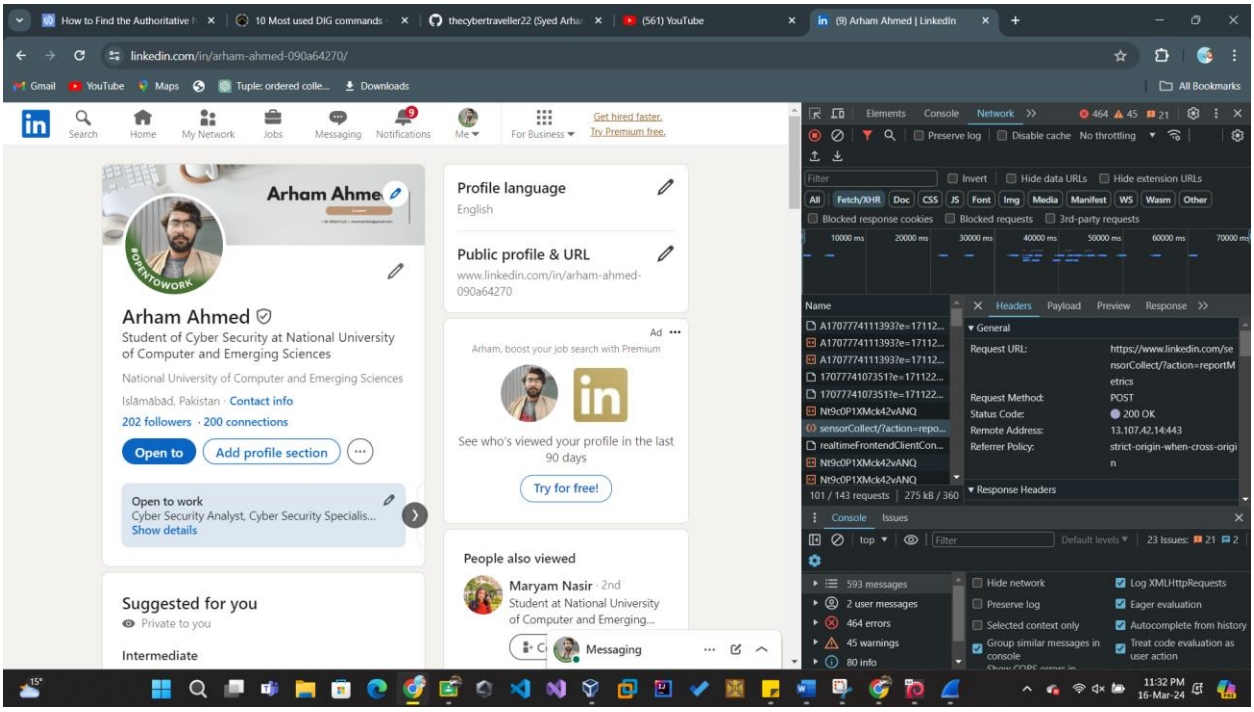
Q.3.



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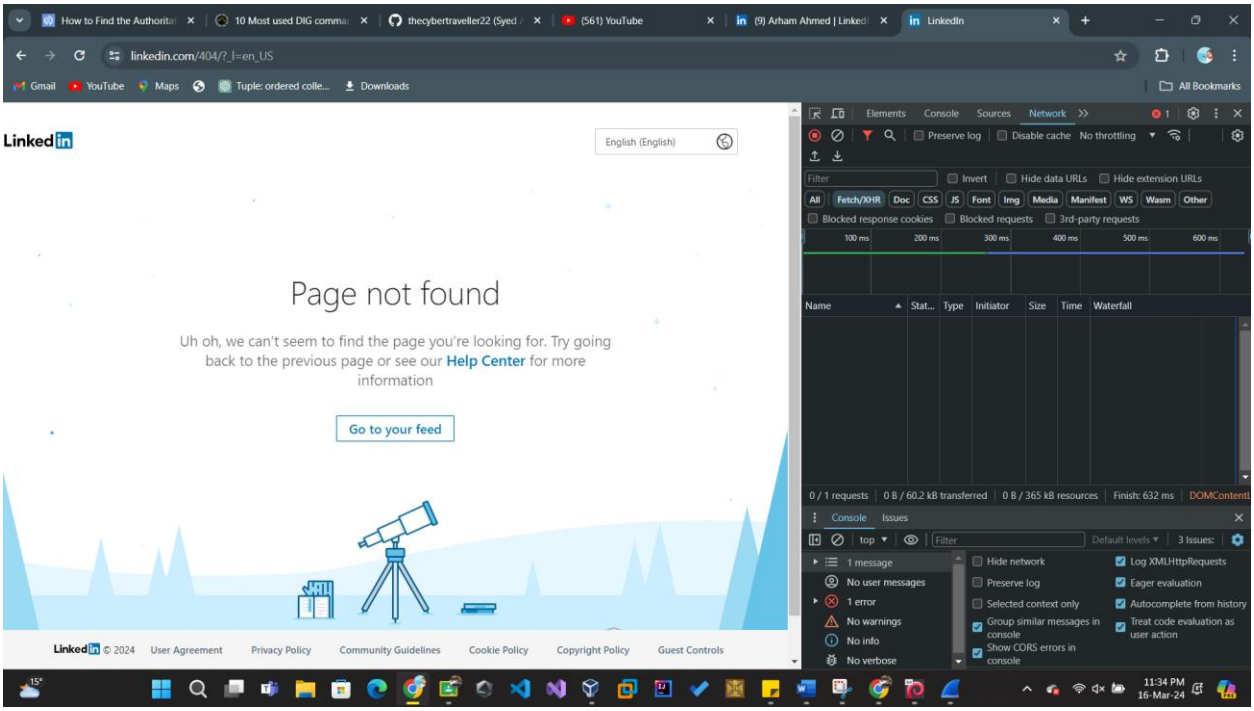

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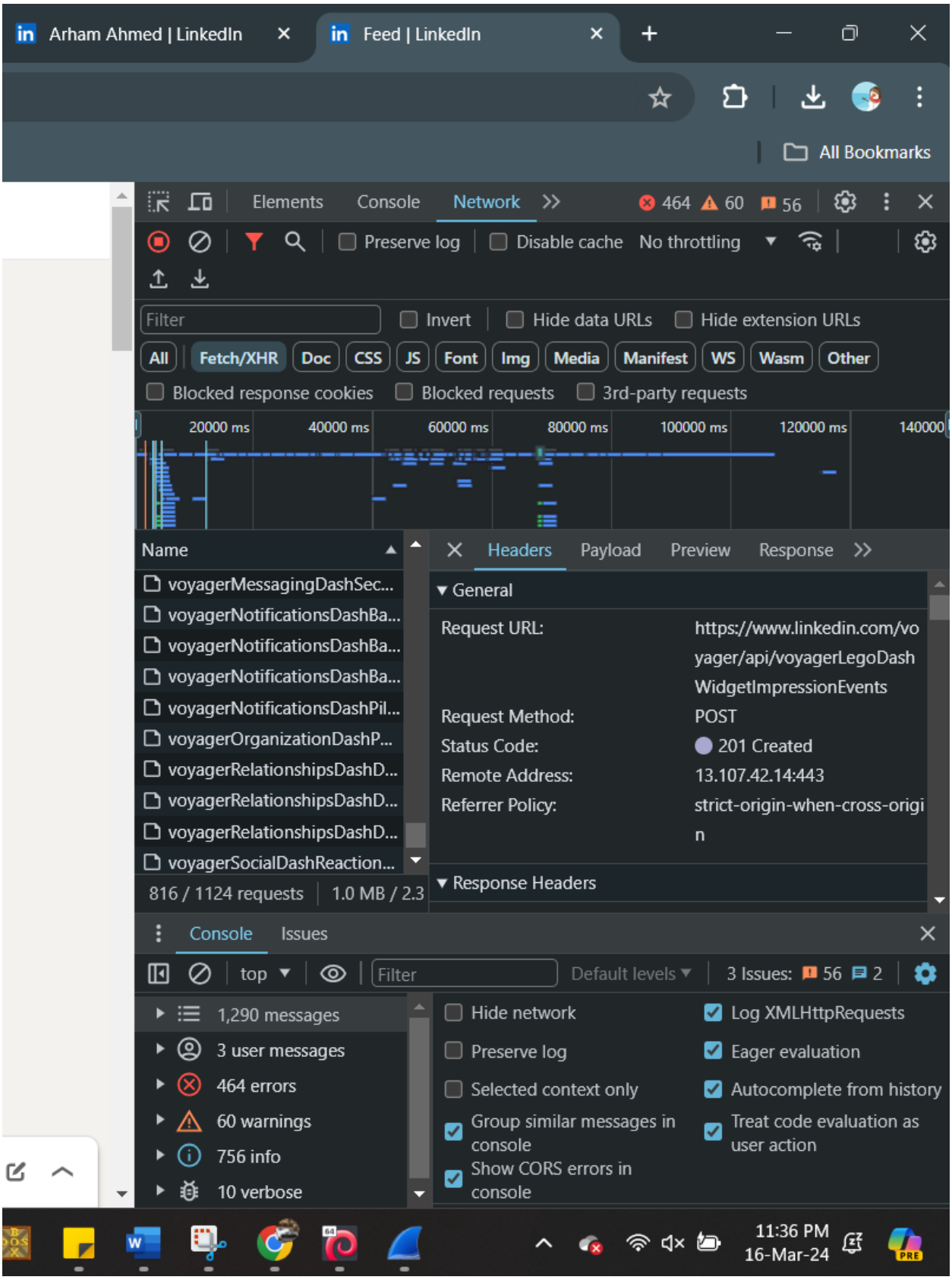

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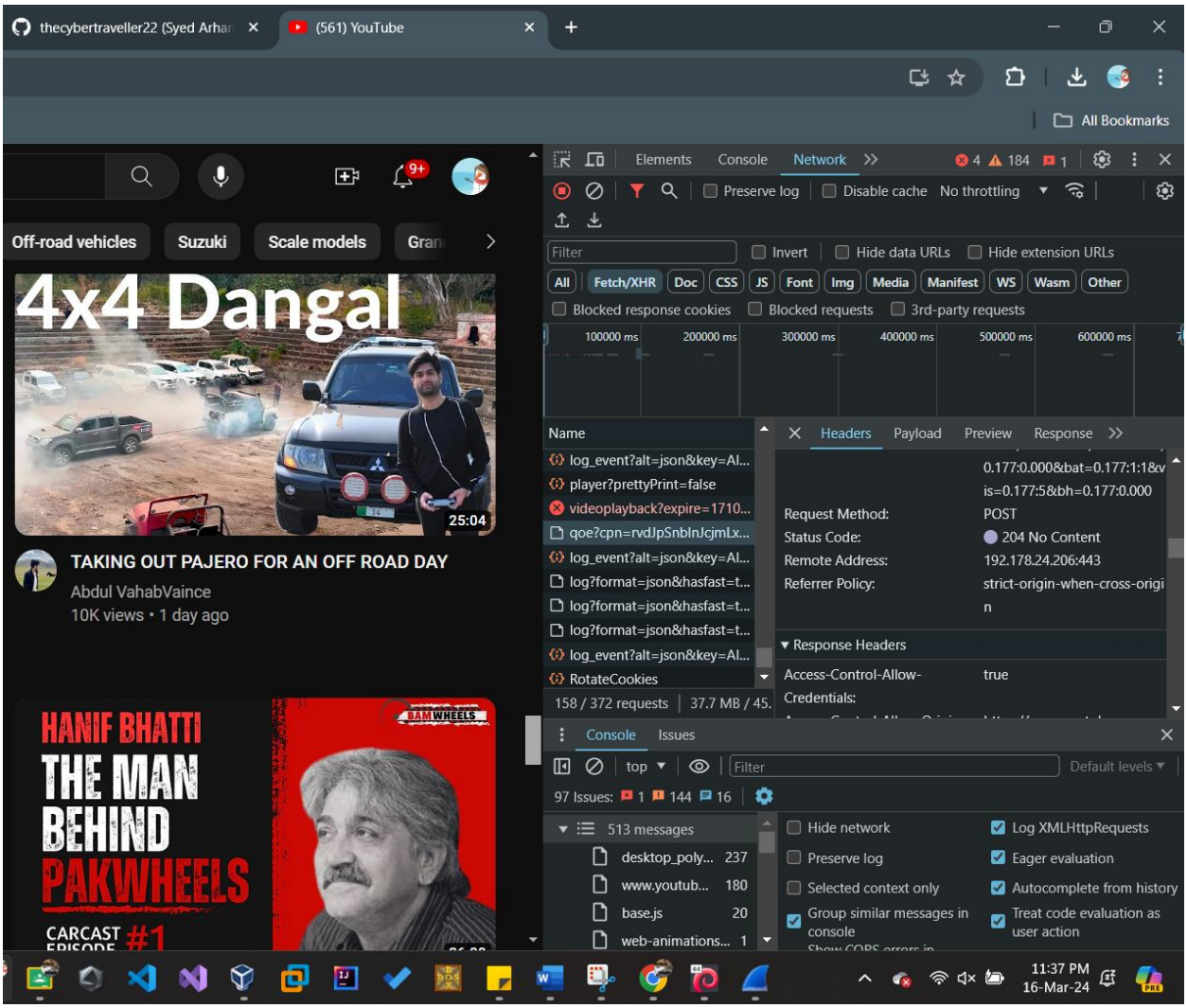
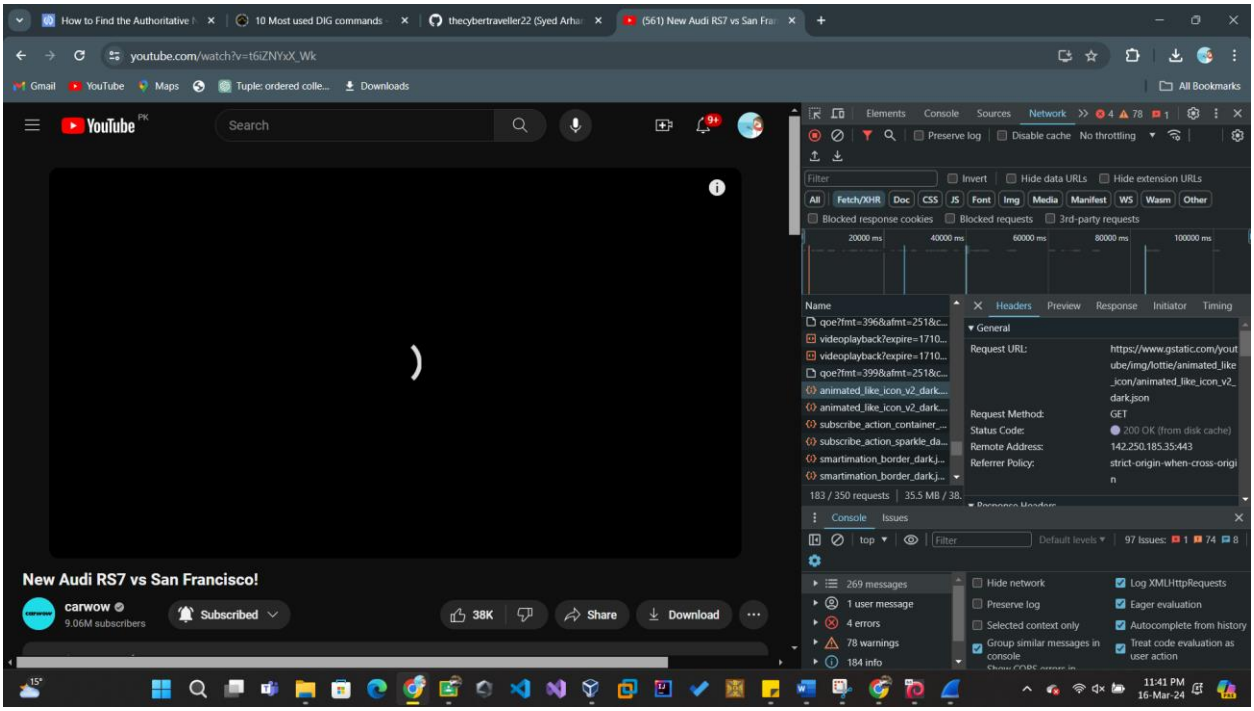


Syed Arham Ahmed_22i-1552_BS-CY-B_CNET_Assignment#2



The above image shows us that it got the data from the cache instead of asking the DNS server.